CLAIMS

1. A method for minimizing inspection spot size and noise during film thickness measurement, comprising:

locating a first eddy current sensor directed toward a first surface of a substrate associated with a conductive film;

locating a second eddy current sensor directed toward a second surface of the substrate associated with the conductive film, the second surface opposing the first surface;

alternating power supplied to the first eddy current sensor and the second eddy current sensor, such that the first eddy current sensor is powered while the second eddy current sensor is not powered and the first eddy current sensor is not powered while the second eddy current sensor is powered; and

calculating the film thickness measurement based on a combination of signals from the first eddy current sensor and the second eddy current sensor.

2. The method of claim 1, wherein the method operation of locating a second eddy current sensor directed toward a second surface associated with the conductive film includes,

offsetting an axis of the first eddy current sensor from an axis of the second eddy current sensor.

3. The method of claim 2, wherein the method operation of alternating power supplied to the first eddy current sensor and the second eddy current sensor includes,

a) supplying power to the first eddy current sensor;

b) terminating power supplied to the first eddy current sensor;

c) waiting for a delay period;

d) supplying power to the second eddy current sensor;

e) terminating power supplied to the second eddy current sensor; and

f) waiting for the delay period.

4. The method of claim 3, further comprising:

repeating steps a)-f) for each location being measured.

5. The method of claim 1, wherein the method operation of locating a second eddy current sensor directed toward a second surface associated with the conductive film includes,

aligning the first eddy current sensor to be coaxial with the second eddy current sensor.

6. The method of claim 5, wherein the method operation of alternating power supplied to the first eddy current sensor and the second eddy current sensor includes,

configuring both of the first eddy current sensor and the second eddy current sensor so that an appearance as an inductive load in minimized when the respective eddy current sensor is passive.

7. The method of claim 6, wherein the method operation of configuring both of the first eddy current sensor and the second eddy current sensor so that an appearance as an inductive load in minimized when the respective eddy current sensor is passive includes,

incorporating both of the first eddy current sensor and the second eddy current sensor into an open loop.

8. The method of claim 1, further comprising:

supplying power to both the first eddy current sensor and the second eddy current sensor from a single power supply; and

repeating the alternating of the power such that both the first and the second eddy current sensors are powered at alternating times for each location.

9. A sensor array for mapping a wafer thickness, comprising:

a plurality of top sensors;

a plurality of bottom sensors opposed to the top sensors, wherein each of the plurality of bottom sensors is coaxial with a corresponding one of the plurality of top sensors, the plurality of bottom sensors further configured to be passive when the corresponding one of the plurality of top sensors is active;

a power supply in communication with both the plurality of top sensors and the plurality of bottom sensors; and

a controller configured to alternate power from the power supply to the plurality of bottom sensors and the plurality of top sensors.

10. The sensor array of claim 9, wherein the plurality of top sensors and the plurality of bottom sensors are eddy current sensors.

11. The sensor array of claim 9, wherein the controller is further configured to incorporate a delay time when switching the sensors from a passive state to an active state.

12. The sensor array of claim 9, wherein the sensor array is incorporated into an aligner station of a semiconductor processing tool.

13. The sensor array of claim 11, wherein the delay time is 1 millisecond.

14. A system for processing a wafer, comprising:

a chemical mechanical planarization (CMP) tool, the CMP tool including,

a wafer carrier defined within a housing, the wafer carrier having a bottom surface having a window defined therein;

a carrier film affixed to the bottom surface of the wafer carrier, the carrier film configured to support a wafer during CMP operations; and

a sensor embedded in the wafer the sensor disposed over a top surface of the window, the sensor configured to induce an eddy current in the wafer to determine a proximity and a thickness of the wafer;

a sensor array external to the CMP tool, the sensor array in communication with the sensor embedded in the wafer carrier, the sensor array including a first sensor and a corresponding second sensor, the first sensor and the corresponding second sensor configured to alternate between an active state and a passive state, the first sensor further configured to be in an active state when the second sensor is in a passive state, the sensor array configured to detect a wafer thickness signal that is independent of a distance of the first sensor and the corresponding second sensor to the wafer.

15. The system of claim 14, wherein the first sensor and the corresponding second sensor of the sensor array have a common axis.

16. The system of claim 14, wherein an axis of the first sensor is offset from an axis of the corresponding second sensor of the sensor array.

17. The system of claim 16, wherein a signal from the first sensor is averaged with a signal from the corresponding second sensor to determine an initial thickness.

18. The system of claim 14, further comprising:

a power supply in communication with both the first sensor and the corresponding second sensor; and

a controller configured to alternate power to the first sensor and the corresponding second sensor.

19. The system of claim 15, wherein the controller is in communication with the embedded sensor and the sensor array, the controller configured to determine a thickness of the wafer from a signal provided by either the embedded sensor or the sensor array, the controller capable of providing a thickness profile of both a wafer prior to CMP and a wafer after CMP to a CMP controller.